



## Managing lightbrown apple moth

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### Other topics in this Viti-Notes series include:

- Characteristics of lightbrown apple moth
- Monitoring lightbrown apple moth
- Managing lightbrown apple moth

### Management considerations

#### Population stages and timing

- There are generally two generations of LBAM within a season. In the first generation, eggs are laid in the vines shortly after leaves unfold in the spring and the second generation starts around veraison.
- If the early season population in a vineyard is kept under control, it is less likely that there will be a substantial second generation. There may be exceptions if LBAM move in from adjacent vegetation.

#### Pesticide residues and beneficials

Although there are several pesticide options for spraying at flowering which are effective on larger caterpillars, the risk of pesticide residues at harvest limits the available management options to only targeting small caterpillars in the second generation.

Using 'soft' sprays protects LBAM predators and parasites and helps reduce risk of late-season problems.

#### Deciding if LBAM is a problem

The cost of applying a treatment needs to be considered against the potential cost of not spraying, but there has to be a point, or threshold, at which a control is justified. Developing this threshold needs to be done for a particular region, site and variety, and this can only occur if an effective monitoring program and consistent record keeping is applied over a number of seasons.

A THRESHOLD NEEDS TO RELATE LBAM NUMBERS FOUND DURING A SEASON WITH LEVELS OF BUNCH DAMAGE ASSOCIATED WITH LBAM AND/OR BOTRYTIS AT HARVEST

Some of the considerations for setting a threshold include:

- LBAM damage to berries provides an entry point for Botrytis and therefore, vineyards or blocks with a history of Botrytis problems or susceptible varieties will have a lower tolerance for LBAM, e.g. vineyards in Sunraysia will generally have a higher tolerance for LBAM numbers than in the Yarra Valley, and within a region, the tolerance will be higher in Cabernet Sauvignon compared with Chardonnay.
- A large population of natural predators in the vineyard, such as lacewings and spiders may affect threshold levels.

IT TAKES TIME TO BUILD UP CONFIDENCE IN MONITORING AND THE HISTORICAL DATA REQUIRED TO DEVELOP THRESHOLDS FOR A VINEYARD

### Different management options

#### Eggs and small caterpillars – the best targets

Egg monitoring is the most efficient approach for assessing the potential population of small caterpillars:

- newly hatched caterpillars are very small and difficult to find quickly;
- monitoring whole shoots for eggs and larvae is effective, but takes more time than targeting certain leaves;
- monitoring will need to start before flowering.

EGG MASSES LAID ON YOUNG LEAVES OFTEN DETACH AND DROP OFF AS LEAVES EXPAND AND GROW, KILLING THE DEVELOPING LARVAE.

Application of *Trichogramma* wasps, a biological control option, relies for its effectiveness on timing wasp releases with the presence of viable LBAM eggs, while chemical sprays targeting small caterpillars should be applied shortly after the first eggs start hatching.

Monitor for larvae after controls are applied to assess the efficiency of the treatment.

## Controlling larger caterpillars in bunches

Larger caterpillars are easy to detect at flowering due to their webbing in bunches, but there are currently no late season sprays registered in Australia for larger caterpillars. Therefore application of effective control methods which aim to limit the numbers of younger larvae is vital.

## From budburst

Mating disruption of moths using pheromone ties provides an alternative to applying chemical sprays, but there are some limitations to their use:

- This method is less effective if used to treat smaller areas or where high LBAM numbers are present;
- Pheromone ties need to be used from the start of the season to be effective;
- As LBAM numbers can vary between seasons and controls are not always required, mating disruption may be an unnecessary expense in some years.

## Up to flowering

A number of broad spectrum insecticides are registered for use against LBAM, and there are restrictions on the timing of application. As these compounds often impact on other insect and mite species, their use can have a negative impact on beneficials and result in secondary pest problems. To minimise this, the use of soft control options should given priority.

## Later in the season

### *Bacillus thuringiensis*

*Bacillus thuringiensis* (Bt) products remain available for management of LBAM after berry set. There are some considerations if using these products:

- To give Bt products the best chance of working they need to be applied soon after LBAM egg hatch as they are not effective against larger larvae;
- Monitoring should be conducted a week after application to assess effectiveness of the application;
- Results have been mixed in past years.

## Parasitic wasps

*Trichogramma* wasps can be bought from commercial insectaries for mass release in vineyards. This wasp lays its eggs in the eggs of LBAM, killing the larvae and instead hatching a new generation of wasps which continue to parasitise any remaining LBAM eggs. Effective monitoring is critical for the success of *Trichogramma* to ensure they are released at the beginning of a LBAM egg laying period. There are some limitations on their use, e.g. low temperatures and sulfur adversely affect them.

## The vineyard floor

Removing LBAM host plants such as the broadleaf weeds, capeweed and clover, from the vineyard and planting non-host cover crop species such as grasses may reduce LBAM pressure. The presence of host plants allows the build-up of LBAM numbers during the season and the survival of larvae during winter. Monitoring for LBAM larvae in vineyard floor plants will enable the value of this strategy to be assessed.

## Summary

Effectively managing LBAM involves:

- Looking critically at the effectiveness of current management programs;
- Planning for a production environment in which pesticide use will likely become increasingly restricted;
- The implementation of a systematic monitoring program, with good record keeping;
- Focusing on vineyard practices which protect and support beneficial insects by using selective chemicals.

The following checklist (*Table 1*) may assist in planning strategies this season. Focus on any practices not currently undertaken.

*Table 1 LBAM management checklist*

Monitor strategically for LBAM and beneficials.

Develop action thresholds based on data collected from monitoring and damage assessments at harvest over a number of seasons.

Consult winery for restrictions on chemical use.

Only apply controls when and where action thresholds are exceeded.

Use selective chemicals or biological control options as first preference.

Apply controls at the most vulnerable stage of LBAM lifecycle.

Monitor for larvae after controls are applied to assess spray efficacy.

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## Further information

### Training

For regional specific training in pest and disease control, the AWRI is running Research to Practice: Integrated Pest Management for changing viticultural environments.

### Contact

Marcel Essling: [rtp@awri.com.au](mailto:rtp@awri.com.au) for more information.

## Agrochemical information

Agrochemicals registered for use in Australian Viticulture - updated annually.

Visit [www.awri.com.au](http://www.awri.com.au) for the latest version.

## Useful references

Nicholas, P., Magarey, P.A. and Wachtel, M. (Eds.) 1994 Diseases and pests, Grape Production Series 1, Hyde Park Press, Adelaide (a glove box edition of this book is also available).

For images of grapevine symptoms visit [www.winetitles.com/diagnosis/index.asp](http://www.winetitles.com/diagnosis/index.asp).

Product or service information is provided to inform the viticulture sector about available resources and should not be interpreted as an endorsement.



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